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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,284	03/31/2006	Mitsuru Eida	288244US2PCT	5500

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

GUHARAY, KARABI

ART UNIT	PAPER NUMBER
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2889

NOTIFICATION DATE	DELIVERY MODE
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07/02/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/574,284	EIDA ET AL.	
	Examiner	Art Unit	
	Karabi Guharay	2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE, filed on 5/26/2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,4,7,11,12,14,15,19,21,24,27 and 30-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,4,7,11,12,14,15,19,21,24,27 and 30-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/26/2010 has been entered.

Response to Amendment

Claims 3,7,11,12,24,30 and 31 are amended. Claims 13, 20, 22, 25 and 28 are canceled.
New claims 33-38 are added.

Currently, claims 3, 4, 7, 11, 12, 14, 15, 19, 21, 24, 27 and 30-38 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3-4, 7, 11-12, 14-15, 19, 30-32, 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 2003/0132701).

Regarding claims 3-4, 7, 11-12, 14-15, 19, 30-32 & 34-35, Sato et al. discloses a luminescent device or a display (Fig 1A and Fig 1B; paragraph 1) that emits white light (paragraph 10) comprising a color conversion layer (5) and an emitting medium (1) which is a light emitting diode (paragraph 31) wherein the color conversion layer comprising a fluorescent medium (4) for converting light in a blue range emitted from the emitting medium (paragraph 6) to light having a longer wavelength (paragraphs 6 and 65). Sato et al. further teaches a diffusing agent, which are particles of an inorganic material such as titanium oxide (paragraph 69) is added to the color conversion medium which causes satisfactory random reflection (scattering), Further Sato et al. teaches that the inorganic particles are coated with transparent resin material (since diffusing particles are dispersed in resin media) which suppress extinction of fluorescent medium caused the particles (here TiO₂ is used as diffusion agent, which are photocatalyst and thus cause extinction of fluorescent medium means being broken down; further TiO₂ is coated with resin which prevents interaction of TiO₂ particles with fluorescent particles, thus prevents extinction

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of fluorescent particles), and the color conversion layer is formed on the substrate (on the mounting resin ; paragraph 83).

Though it is not mentioned explicitly, since scattering of light inside the color conversion medium is made high, amount of haze value is high, and further Sato et al. teaches that the application of diffusion agent can be varied depending on the intended application. Thus it would have been obvious to one having ordinary skill in the art to set the haze value of the color conversion medium to 50% to 95% so as to have more internal reflection in the medium, to obtain higher color purity (see paragraphs 69-70).

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al., and further in view of Yu et al. (US 2002/0063520).

Regarding claim 24, Sato et al. discloses all the limitations of claim 24, except for a color filter stacked on the device.

However, in the same filed of light emitting device (Fig 7), Yu et al. discloses a color conversion layer (52) and a color filter layer (55) is stacked on the device (paragraph 13 & 30) in order to improve the purity of the emitted light.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a color filter stacked in the device of Sato et al. since color filter will improve the purity of the emitted color.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. as applied to claims 3-4 above, and further in view of Sylvester et al. (US 2004/0252933).

Regarding claims 21, Sato discloses diffusing material being inorganic oxide, however, is silent about whether the particles are solid or hollow.

However, Sylvester et al. in the device of light distribution, teaches that both solid and hollow micro-spheres are suitable scattering particles for uniform light distribution (paragraph 43).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to have hollow particles for scattering since selection of known material for known purposes is within the skill of art.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 2003/0132701), and further in view of Kuma et al. (US 2003/0127968).

Regarding claim 27, Sato et al. disclose all the limitations of claims 27, except for a color filter material being mixed with fluorescent medium in color conversion layer.

However, in the filed of luminous device, Kuma et al. disclose that light adjusting members (see Fig 6) comprises the mixture of fluorescent dye as color converting material and a color filter material in order to produce improved color of the device (paragraphs 3 & 7-9).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the mixture of fluorescent dye as color converting material and a color filter material in order to produce improved color.

Claims 3, 33, 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 2003/0132701), and further in view of Gonick et al. (US 3510333).

Regarding claim 3, 33, 36-37, Sato et al. disclose a color conversion layer (5; Fig 1A and Fig 1B) comprising a fluorescent medium (4) for converting light in a blue range emitted from the emitting medium (paragraph 6) to light having a longer wavelength (paragraphs 6 and 65), and teaches an inorganic material such as titanium oxide as a diffusing agent (paragraph 69) is

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added to the color conversion medium which causes satisfactory random reflection (scattering), and further teaches a binder resin (see Abstract).

However, Sato et al. fails to disclose that the inorganic particles such as TiO_2 is coated with a material selected from the group consisting of alumina, zirconia, silica, zirconia silicate, alumina silicate, and borosilicate glass, which is a material for suppressing extinction of the fluorescent medium caused by Catalytic TiO_2 particles.

However, Gonick et al. teach that scattering particle TiO_2 , when surface coated by alumina exhibits better scattering property for blue light (lines 31-62 of column 2).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to coat the inorganic scattering particles of Sato et al. with a coating of alumina, as taught by Gonick et al. which has the property of suppressing extinction of the fluorescent material caused by catalytic TiO_2 particle, so as to increase the scattering of blue light.

Regarding claim 38, Sato teaches epoxy resin as the binder resin, however, other resins such as polyalkyl methacrylate, polyacrylate, alkyl methacrylate/methacrylic acid copolymer, polycarbonate, polyvinyl alcohol, polyvinyl pyrrolidone, hydroxyethylcellulose, and carboxymethylcellulose are widely used as binder for forming layers.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose one of the above resins since selection of known materials for known purposes is within the skill of art.

Response to Arguments

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Applicant's arguments filed on 5/26/2010 have been fully considered but they are not persuasive.

First of all, applicant contends that Sato only teaches SiO₂ particles as the diffusing agent, which is not true. Sato teaches TiO₂ particles also as diffusing agent (see paragraph 69), further surfaces of fluorescent and scattering particles are coated with resin so as to not contact each other, and coating prevents TiO₂ particles to interact with fluorescent particles, which suppresses extinction of fluorescent particles.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is 571-272-2452. The examiner can normally be reached on Monday-Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh-Toan Ton can be reached on 571-272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karabi Guharay/
Primary Examiner, Art Unit 2889

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